

Serum Ferritin And Hepcidin Levels In Hepatitis C Patients

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Abstract: - *The aim of the study detects the relation between serum ferritin and hepcidin with hepatitis C virus One hundred subjects (men and women) were taken in the current study. Forty-four subjects without infection used like control group and fifty-six subjects with hepatitis C virus. The results demonstrate high significant ($P < 0.05$) elevate in levels of serum ferritin and hepcidin in subjects with hepatitis C compare with health subjects. It was concluded that there is positive relationship between serum ferritin, hepcidin and hepatitis C.*

Keywords: *Hepcidin; Ferritin; Hepatitis C.*

INTRODUCTION

Hepcidin peptide was firstly as antimicrobial peptide (rich in cysteine) for urinary system microorganisms. the studies demonstrated that hepcidin peptide is synthesis and produce in mice with overload of iron and that it plays an important activity in homeostasis of iron in animals with disease known as iron storage [1]. Hepcidin peptide lead to ferroportin degeneration and the divalent metal transporter 1 (DMT1) with endocytosis process [2], which appears hepcidin ability to decrease absorption of iron and mechanisms of recycling process [3], a chronic increasing of levels of hepcidin leads to states of iron-deficiency [4], while the reduce in hepcidin is related with high iron concentration, as is appear in patients with hemochromatosis disease [5]. Ferritin defines as a mechanism of primary iron storage and is critical to homeostasis of iron [6]. Ferritin define as a protein (complex globular form), precipitates inside reticuloendothelial cells, especially in composts formation with iron and in the ferric reserve and metabolism process [7]. It is therefore a parameter of ferric very essential in the prognosis of anaemia type iron deficiency, ferropenia, increasing of status of ferric. In certain inflammatory processes conditions, ferritin may be elevated, also in inflammatory anaemia diaseas and diseases of autoimmune like rheumatoid arthritis [8]. Disease of viral hepatitis is a worldwide health problem that needed to knowledge and planning [9]. Hepatitis type C (HCV) spread is 3% of world people with many cases about 170 million. About 50% of all patients convert to chronic carriers that may suffer cirrhosis

and hepatic cancer [10]. So, the aim of this study is detect the relation between serum hepcidin, ferritin and hepatitis C virus.

MATERIALS AND METHODS

Volunteers

One hundred subjects (male and female) were taken in the current study. Forty-four volunteers without infection used as control group and fifty-six volunteers' with hepatitis C randomly who referred to private labs in Kirkuk between May 2018 to February 2019, range of age between (25-40 years). The subjects were divided to two groups (according to infection).

Sample Collection

Five milliliters (5ml) of venous blood samples were obtained from the volunteers. All samples were put into test tubes until its clotting. Sera were collected after blood samples were centrifuged at 5000 rpm for ten min. and stored until assayed for laboratory investigations.

Measurement

Serum ferritin and hepcidin

Serum ferritin was assayed by UBI Magiwel™-United Biotech ferritin quantitative test system, a solid phase enzyme-linked immunosorbent assay (ELISA) kit, according to the manufacturer instructions. Serum hepcidin concentration are determined by ELISA kit.

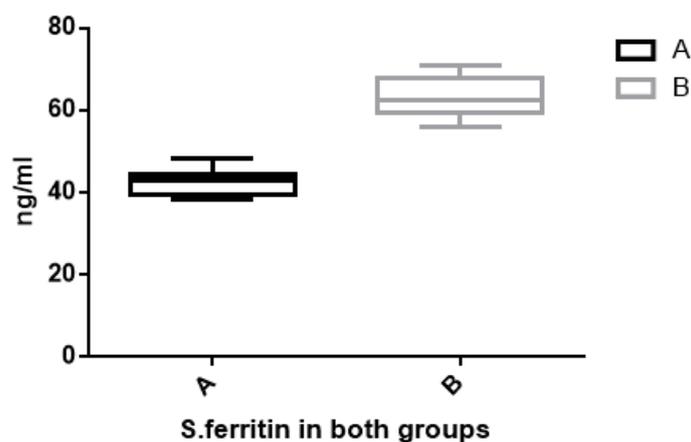
Statistical Analysis

The results were analyzed to determine the mean value and standard error of different parameters. The statistical analysis (2012) method was used to study the correlation of different groups with activity of ALT enzyme. Student, s t-test was used to compare between two groups and significance between the mean values was considered when $p < 0.05$ [11].

RESULTS AND DISCUSSION

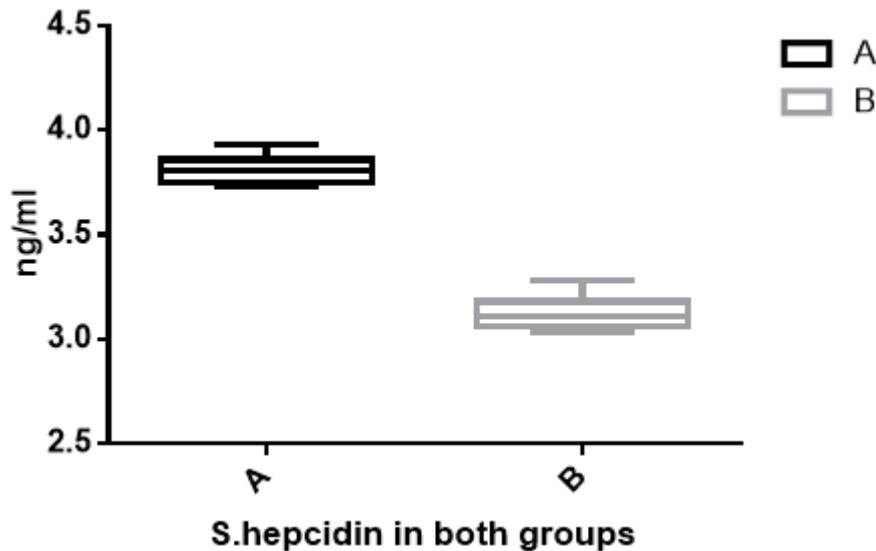
Serum ferritin

The levels of S.ferritin show significant increase ($P < 0.05$) in volunteers with hepatitis C compare with control group as shown in figure (1).



The results demonstrated high significant ($P < 0.05$) increase in patients with hepatitis C virus.

the current results were in agreement with Oikonomou et al. who carried a study on 192 patients with cirrhosis. They found that high serum ferritin levels is related with worse results in hepatic cirrhosis patients [12]. Also, Finkenstedt et al. referred in their study that increased in serum ferritin levels and transferrin saturation are related with little survival in hepatic cirrhosis disease [13]. Increased serum ferritin in chronic hepatic disease patients may be related with overload of iron in sites located extrahepatic, and especially myocardial iron accumulation may.



The results demonstrate significant ($P < 0.05$) reduce in patients with hepatitis C virus. the current results were in agreement with Tawfik et al, referred that the reduce in levels of hepcidin along with elevated levels of ferritin in cirrhotics and the concentrations also related with the disease severity [15]. Level of hepcidin is expected to reduce in CLD patients.

REFERENCES

- [1] D'Angelo, G. (2013). Role of hepcidin in the pathophysiology and diagnosis of anemia. *J. Blood Res.* 48(1): 10-15.
- [2] Brasse-Lagnel, C.; Karim, Z.; Letteron, P.; Bekri, S.; Bado, A.; Beaumont, C. (2011). Intestinal DMT1 cotransporter is down-regulated by hepcidin via proteasome internalization and degradation. *J. Gastroenterology.* 140: 1261–1271.
- [3] Ganz, T. Hepcidin and iron metabolism, 10 years later. *Blood* 2012, 117, 4425–4433.
- [4] Kroot, J.C.; Tjalsma, H.; Fleming, R.; Swinkels, D.W. (2011). Hepcidin in human iron disorders: Diagnostic implications. *J. Clin. Chem.* 57, 1650–1669.
- [5] Domínguez, R.; Antonio J. S. O.; Fernando M. O.; Adrián F. M.; Moisés G. P.; Álvaro L. S. and Alberto P. L. (2018). Effects of an Acute Exercise Bout on Serum Hepcidin Levels. *J. Nutr.* 10(209): 1-22.
- [6] Knovich, M. A.; Jonathan A. S.; Lan G. C. and Suzy V. T. (2009). Ferritin for the Clinician. *J. Blood Rev.* 23(3): 95–104.
- [7] Noemia, L. M. and Valls L C. (2018). Ferritin: Could be a Health Indicator. *J. Fam Med. Dis. Prev.* 4(2): 1-8.
- [8] Mahieu MA, Ramsey-Goldman R (2017) Candidate Biomarkers for Fatigue in Systemic Lupus Erythematosus: A Critical Review. *J. Cur. Rheumatol. Rev.* 13: 103-112.
- [9] Kane M. (1995). Global program for control of hepatitis B infection. *J. Vaccine* 13(1): 47-49.

- [10] AL-Hawaz ,M. H.; Mohammed H. and Shatha A. (2014). Prevalence of hepatitis b and hepatitis c among preoperative surgical patients at basrah general hospital. *Bas J Surg.* 20: 62-65.
- [11] Statal Analysis System. 2012. User's Guide. Statistical version 9.1 th Ed . Inst. Inc .Cary. N.C .USA.
- [12].Finkenstedt A, Krapf S, Vogel W et al. (2016): The iron score is an Meld-independent predictor of survival in patients with liver cirrhosis. *Journal of Hepatology*, 64(2):S443.
- [13] Pietrangelo A, Cohen LA, Waidmann O et al. (2015): Reply to: Ferritin in decompensated cirrhosis: iron or inflammation. *Journal of Hepatology*, 62:492-501.
- [14] Cakir, M.; Erol E.; Elif S.T.; Yuksel A.; Gokce P. R.; Umit C. and Selim D. (2015). Hecpidin Levels in Children with Chronic Liver Disease. *Saudi J Gastroenterol.* 21:300-305.
- [15] Tawfik NM, Hegazy MA, Maksoud IA et al. (2012): Iron load and serum hepcidin in hepatitis C virus-related hepatocellular carcinoma. *Euroasian J Hepato-Gastroenterol.*,2(1):24-27.
- [16] Camaschella C. (2013). Iron and hepcidin: A story of recycling and balance. *Hematology Am Soc Hematol Educ Program.* 2013:1 8
- [17] Meynard D.; Babitt J.L. and Lin H.Y. (2014). The liver: Conductor of systemic iron balance. *Blood.* 123:168 176.
- [18] AL-Samarraie, M. Q., Omar, M. K., Yaseen, A. H., & Mahmood, M. I. (2019). The Wide Spread of the Gene Haeomolysin (Hly) and The Adhesion Factor (Sfa) in The E. coli Isolated From UTI. *Journal of Pharmaceutical Sciences and Research*, 11(4), 1298-1303.
- [19] Abdulazeez, M., Hussein, A. A., Hamdi, A. Q., & Mustafa, M. A. (2020). Estimate the Complications That Resulting from Delayed Management of Dental Trauma in Tikrit City. *Journal of Cardiovascular Disease Research*, 11(2), 80-82